

tained in the volume as to the various relationships of the natural orders described in it, the morphology of their genera, the distribution of the different types, and the economic products obtained from the species, is immense. It possesses, however, the defect so common in foreign scientific works, of the absence of any table of contents or index to the subjects treated of. Had the publishers of the English edition supplemented the index of genera and subgenera with one referring to the various topics discussed, they would have rendered the English edition a practically more useful contribution to botanical literature



CALYCANTHUS FLORIDUS: Floriferous shoot.

than the French original. The illustrations are profuse, and of that excellence which we look for in vain in works originally published in this country. We append one of the well-known "Allspice Tree," the *Calycanthus floridus*. The small order Calycanthaceæ, including only the American *Calycanthus* and the Japanese *Chimonanthus*, is one the true position of which has been much disputed by systematists. Baillon makes it a "series" of Monimiaceæ, with which he also unites the Australian *Atherospermeæ*, bringing this order forward from its usual position among the Incompletæ to close alliance with Magnoliaceæ and Anonaceæ.

A. W. B.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his Correspondents. No notice is taken of anonymous communications.]

A New View of Darwinism

I HAVE only just seen the two letters in answer to one from me on Darwinism which you were good enough to insert in NATURE, and to which I ask the favour of being allowed to reply. I have to thank Mr. Darwin for his references and for the tone of his letter, which is in such marked contrast to the angry dogmatism of Mr. Wallace.

Mr. Wallace commences by ridiculing the phrase the Persistence of the Stronger. The phrase was not mine, it has been used by a better man than I, namely, by Prof. Jowett, and it has the advantage of not involving an identical expression, which the *Survival of the Fittest* does. "That those forms of life survive which are best adapted or best fitted to survive," is not a very profound discovery; it might have suggested itself even to a child, and if Mr. Wallace means nothing more than this when

he speaks of the theory of Natural Selection, he cannot claim to have added much to the world's philosophical opinions.

He then complains that I have only touched one of the many facts relied upon by Darwinians; I refer him to my letter, in which I distinctly say that it contained only one of my objections, and that I have many more which will follow if the Editor have patience with the discussion. The reply to Mr. Wallace will confine me, however, in this letter to the ground covered by the former one. Having disposed of the formal and personal matters, I now approach the matters of fact about which we are at issue.

Here, I am sorry to say, I am met in a very different spirit by Mr. Wallace to that in which Mr. Darwin meets objections. Dogmatism, bold and unwavering, was the privilege of the philosophy of the Schools, but in the 19th century it is puerile. Mr. Wallace states boldly, without any authorities, merely as an imperial *ipse dixit*, that the most vigorous plants and animals are the most fertile. I had, at least, the decency to quote the book of Mr. Doubleday, containing a magazine of facts and examples in support of my view, and which tells exactly the other way.

This view has not been correctly stated by Mr. Wallace. The position I maintain is this, that, as a general law, those individuals which are underfed and lead precarious lives, are more fertile than those whose advantages make them vigorous and healthy. The ringing of the bark and the pruning of the roots of barren fruit trees and the starving of domestic animals to make them fruitful were examples to this end.

Mr. Wallace quotes only one example in his own support, and I will accept it as a crucial test of my position, which he will acknowledge to be fair; the case of the Red Indian and the Backwoodsman. The Red Indian lives entirely on flesh, the Backwoodsman almost entirely on vegetable food. Like meat livers in every part of the world, in Mexico, on the River Plate, in Siberia, in Turkestan, and in some parts of Russia, the Red Indian is not a fertile creature. The Backwoodsman, like vegetable feeders everywhere who are not luxurious, in India, China, Poland, and the Russian provinces bordering on it, Ireland, &c., is comparatively fertile, but only comparatively. It is a mistake to suppose that the Backwoodsman is specially fertile, and in a few years he becomes, as the inhabitants of Kentucky and Tennessee have been long known to be, diminishing in numbers, the population of the States being kept up by immigration.

Mr. Chadwick, in his "Sanitary State of the Labouring Classes," observes that where mortality is the greatest there is much the greatest fecundity; thus, in Manchester, where the deaths are one to twenty-eight, the births are one to twenty-six, while in Rutlandshire, where deaths are but one to fifty-two, births are one to thirty-three, showing that a state of debility of the population induces fertility. This only supports the common dicta of doctors that consumptive patients are generally very fertile. The pastoral tribes of Eastern Russia which have recently taken to agriculture, such as the Tchuvashes, &c., have begun to increase most rapidly. The Hottentots at the Cape, who were formerly a numerous race living very hard lives, are almost extinct now that they are carefully tended and well fed. The Yeniseians, the Yukahiri, and other Siberian tribes, have disappeared like smoke before the advance of Russian culture; they have suffered little if at all from the Russian arms.

Let me quote a curious example in answer to Mr. Wallace from the very race to which he has referred. Captain Musters, in describing his recent journey through Patagonia at the Anthropological Institute, told us that it was the custom for the Patagonian women to be bled at certain times referred to, as they believed it made them fertile. Among the Patagonians, therefore, we meet with empirical witnesses, unsophisticated by our philosophy, to the truth of the position I maintain. But those who live in large cities need not travel to Patagonia. The classes among us who team with children are not the well-to-do and the comfortable, but the poor and half-fed Irish that crowd the lowest parts of our towns. I am not contrasting now the fat with the lean, but the comfortable classes with those who lead precarious lives—the vigorous in health with the sickly, the half-fed, and the weak. It will be asked, why rely so much upon man? The answer is that I quite agree with Mr. Darwin that man is subject to the same natural laws as the animals, and further I believe that since we have studied man more closely and under a greater variety of conditions, facts derived from our experience of man are of greater value than those deduced from our examination of the other animals.

But let us turn to these latter for a space; and here I tread with much greater diffidence, for I am aware of the vast ex-

perience and fund of illustration possessed by Mr. Darwin, and I have to say that I am unconvinced by the arguments he has adduced. With the transparent frankness of all his writings, Mr. Darwin, in one of the references to which he has commended me, has collected a very large number of examples that tell very strongly against him, and which I again commend to Mr. Wallace. I refer to the 18th chapter of Mr. Darwin's book on the "Variation of Plants and Animals under Domestication," and especially to that portion beginning on page 149. In speaking of animals, he says:—"The most remarkable cases, however, are afforded by animals kept in their native country, which, though perfectly tamed, quite healthy, and allowed some freedom, are absolutely incapable of breeding. Rengger, who in Paraguay particularly attended to this subject, specifies six quadrupeds in this condition, and he mentions two or three others which most rarely breed. Mr. Bates, in his admirable work on the Amazons, strongly insists on similar cases, and he remarks that the fact of thoroughly tamed wild animals and birds not breeding when kept by the Indians, cannot be wholly accounted for by their negligence or indifference, for the turkey is valued by them, and the fowl has been adopted by the remotest tribes. In almost every part of the world, for instance, in the interior of Africa, and in several of the Polynesian islands, the natives are extremely fond of taming the indigenous quadrupeds and birds, but they rarely or never succeed in getting them to breed," and so on, through sixty pages of closely-packed examples. And what is Mr. Darwin's commentary on these facts? I again quote page 158:—"We feel at first naturally inclined to attribute the result to loss of health, or at least to loss of vigour, but this view can hardly be admitted when we reflect how healthy, long-lived, and vigorous many animals are under captivity, such as parrots and hawks when used for hawking, chetahs when used for hunting, and elephants. The reproductive organs themselves are not diseased, and the diseases from which animals in menageries usually perish are not those which in any way affect their fertility. No domestic animal is more subject to disease than the sheep, yet it is remarkably fertile." Mr. Darwin, with equal clearness and conclusiveness, decides that this sterility cannot be due to a failure of sexual instincts, change of climate or of food, or want of food or exercise; and he concludes that certain changes of habits and of life affect in an *inexplicable manner* the powers of reproduction. But what is true of man it is reasonable to suppose is true of all these instances—namely, that it is a more luxurious habit, a more vigorous health, a less precarious existence, induced by the care and attention of domesticators, that have caused the sterility; that these animals are too well off, and not that they are ill off in any way; and this theory explains the whole most conclusively. On the other hand, and in opposition to this vast and uniform collection of examples, Mr. Darwin adduces a few instances which tell the other way, but they are very few in number, and seem to me explicable on other grounds. Ferrets, it is notorious, are always kept in a state of extreme depletion and as thin as possible. Domestic poultry are fed almost entirely on poor vegetable food, while their wild and semi-wild relatives feed much more on worms, insects, and on animal diet generally. In regard to sheep, it is notorious that very weak ewes generally bear twins, that Somerset and Dorset are more fertile than Southdowns and Leicesters. We have, I may add, no facts to guide us in regard to wild dogs, and few in regard to wild cats; but we do know that in tame ones the half-fed lantern-ribbed curs are more prolific than their sleek relations. In regard to domestic fowls, and especially pigeons, we must remember that their condition is materially altered by the disuse or only very partial and irregular use of their powers of flight; this must reduce their circulation and vigour very considerably, and make them *pro tanto* so much weaker. But these instances, upon which Mr. Darwin relies to answer Doubleday and others, are very partial indeed. In his own pages, as I have already said, they form a very small element compared with the overwhelming cases he quotes on the other side. So much so, indeed, that these cases may be taken as exceptions which prove the rule that domestication and improved conditions of life induce sterility in animals.

It savours of scholastic philosophy to speak of Nature as exercising any influence on the regeneration of races, and yet there may be sound philosophy in the old notion that when an individual or a class is in danger of being extinguished from want, Nature puts forward a special effort to preserve it. The sickly mother, the half-starved plant, is more likely to breed than the healthy and the vigorous. If we remove the peasant's family to the drawing room, it will cease to be composed of ten and twelve children. If we remove our daisies and

cowslips to the greenhouse, their flowers grow double, and they ripen no seeds. The vine that has felt the frost is the one to pay the rent. Wherever we turn, in fact, we meet with examples of the universal law; and this law seems to be at issue with an important portion of Mr. Darwin's theory, namely, that in the struggle for existence, the vigorous, the hearty, and the well-to-do, elbow the weak and decrepid until they elbow them out of existence, and supplant them. If I have said anything above which can be construed into an impertinence, I unconditionally withdraw it. The only excuse for soreness, is an impatience at what seems to the writer to be indefensible dogmatism. The days will not be ripe for scientific dogmatism until the Infallibility of Positive Philosophers has been generally accepted, and it does not do to forestall that millennium.

H. HOWORTH

MR. WALLACE has effectually set aside Mr. Howorth's new views on Darwinism, and it now only remains to point out that the latter gentleman, in his instances, puts the cart before the horse. Hens that are fat and don't lay are fat because they don't lay. When the sexual powers, either in plants or animals, are defective from accident or design, the overgrowth always takes place, and this among animals is chiefly by the increase of adipose tissue.

Birmingham

LAWSON TAIT

Recent Neologisms

I HAVE been long accustomed to register the first appearance of new words and phrases. Of course the vast majority of these take no root, perishing where they fall. Here is a sample of the latest issue: *Survival*, introduced, I think, by Darwin; *indiscipline* and *impolicy*, which were brought in by the Franco-Prussian War, and also the vulgarism to *telegram*. The greatest atrocities in this line are committed by "physicists," if the shade of Faraday will pardon me the use of that word; and far away the worst coinage I ever encountered is due to Mr. Alfred R. Wallace. As it is "meet and right and our bounden duty" to stigmatise such intruders, and if possible prevent their adoption, I take the liberty of making my feeble protest against Mr. Wallace's "prolificness," which he introduces to our notice in his letter on Mr. Howorth (*NATURE*, July 6, 1871, p. 181). In this case the hideousness of the coinage is some guarantee against its reception.

Malvern Wells, July 8

C. M. INGLEBY

Affinities of the Sponges

I HAVE just read with much interest the paper in *NATURE* by Mr. W. Saville Kent, criticising my friend Carter's article in the "Annals of Natural History" for this month, in which I fully concur. How Mr. Carter can have fallen into such an error, for such I must call it, I cannot imagine, as comparing a group of animals in Botryllus to those sponge cells, even in so highly a developed form as *Grantia*. For, taking this as the highest known form of sponge animal, it is at most only a monociliated sac, as shown both by Prof. Clark and by Mr. Carter. Now, it is well known to all investigators, and Mr. Carter has shown it himself, that the animals of Botryllus have distinct oral and faecal apertures, whereas the sponge cell, so far as has yet been seen, has only an oral aperture. Again, the Ascidian Botryllus is shown to be far higher in the scale when we come to compare its internal organisation, and not merely to confine ourselves to the sac-like tunic. The discharge of the faecal matter into a common cloacal canal is to me not a sufficient reason for comparing these groups of animals to the sponge animals in *Grantia*.

But what I wish to draw attention to more particularly is this, that in the hurry and bustle of our investigators of the present day, all old associations are mostly, if not entirely, forgotten. I can scarcely think that they are ignored, but are forgotten. Thus, Prof. Grant was, I believe, the first to determine the character and the full importance of the seed-like body in *Halchondria* by placing watch-glasses in the vessel in which living specimens of the above sponge was placed; the bodies were thus discharged from the faecal canal of the parent sponge, and attached themselves to the watch-glasses, and he then carefully watched their development. Mr. Carter, being a pupil of Dr. Grant, no doubt followed his teacher's plan of investigation, which has led to the brilliant results of this gentleman's in-